Welcome Reception - Sinder Lounge

Registration and Continental Breakfast - Pacific Ballroom

Welcome and Keynote Address - Sierra Ballroom

Welcome
*Shant Kenderian, The Aerospace Corporation
ISNDCM General Chair*

Keynote Address
*The NASA Engineering and Safety Center Nondestructive Evaluation Technical Discipline Team*
*W. Prosser*
*NASA Engineering and Safety Center, NASA Langley Research Center, Hampton, USA*

Coffee Break – Pacific Foyer

Composites - Sierra Ballroom

*Chair: Shant Kenderian*

Porosity Characterization in Composite Laminates Using Acoustography
*A. Poudel, R. Spencer, T. Chu, J. Sandhu*
*Mechanical Engineering and Energy Processes, Southern Illinois University, Carbondale, USA*

Composite Material Characterization using Computed Tomography and 3D Rendering Techniques
*D. Moore, B. Kernen*
*NDE Ultrasonics \ Experimental Mechanics NDE & Model Validation, Sandia National Laboratories, Albuquerque, USA*

Water Detection in Composites using Ultra Short Echo Time Imaging on a 3-Tesla Whole-Body MRI System
*A. Zimmermann, P. Martirosian, F. Springer, F. Schick*
*Department of Diagnostic and Interventional Radiology - Section for Experimental Radiology, University of Tuebingen, Tuebingen, Germany*

NDC of Resins, Carbon Fiber Fabrics, Preforms and Consolidated CFRPs by HF Radio Wave Techniques
*H. Heuer, M. Schulze, M. Pooch, S. Gäbler*
*Department for Material Diagnostic (FhG IKTS-MD), Fraunhofer IKTS, Dresden, Germany*

Eddy Current Method for Measuring Composite Facesheet Thickness Through Cork
*S. Svetlik-Haley, Y. Kim*
*The Aerospace Corporation, Los Angeles, USA*
11:05–12:35 Lunch Break - Pacific Ballroom

NASA 1 - Sierra Ballroom

Chair: Cara A. C. Leckey, William H. Prosser

12:35 Characterization of Aerospace Composites
C. Leckey, D. Perey, P. Johnston, H. Haldren, W. Yost
Nondestructive Evaluation Sciences Branch, NASA Langley Research Center, Hampton, USA

1:00 Optical Distortion Evaluation in Large Area Windows using Interferometry
R. Youngquist, M. Skow, M. Nurge
Engineering, NASA Kennedy Space Center, KSC, USA

1:25 Composite characterization using laser Doppler vibrometry and multi-frequency wavenumber analysis
P. Juarez, C. Leckey
Nondestructive Evaluation Sciences Branch, NASA Langley Research Center, Hampton, USA

1:50 Subharmonic oscillations and chaos in dynamic atomic force microscopy
J. Cantrell, S. Cantrell
Nondestructive Evaluation Sciences Branch, NASA Langley Research Center, Hampton, USA

2:15-2:30 Coffee Break - Pacific Foyer

Microwave - Sierra Ballroom

Chair: Joseph T. Case, Kristen M. Donnell

2:30 High-Resolution Microwave and Millimeter Wave SAR Imaging of Rubber with Voids and Delamination
R. Zoughi, M. Ghasr, K. Ying, J. Renshaw, T. Eckert
Electrical and Computer Engineering Department, Missouri University of Science and Technology, Rolla, USA

2:55 Advances in Dielectric Property and Thickness Evaluation of Layered Composite Structures using Open-Ended Waveguides
J. Case, M. Ghasr, R. Zoughi
The Aerospace Corporation, Los Angeles, USA

3:20 Microwave Nondestructive Evaluation of Hydration Kinetics in Mortars with and without Sodium Hydroxide Inclusion
A. Hashemi, K. Kurtis, K. Donnell, R. Zoughi
Electrical and Computer Engineering, Missouri University of Science and Technology, Rolla, USA

3:45 Ruggedized Compact Microwave Probes for Mapping Material Properties of Structures
Compass Technology Group, Roswell, USA
4:10-4:25  Afternoon Break - Pacific Foyer

Guided Waves - Sierra Ballroom

Chair: David Moore

4:25  Wavelet spectral finite element modeling of guided wave propagation in lap joints for bondline assessment

D. Samaratunga, R. Jha
Materials Processing Department, The Aerospace Corporation, Los Angeles, USA

4:50  Characteristics of electromagnetic acoustic Lamb wave based on finite element analysis method

L. Songsong, X. Chen
Information Engineering College, Dalian Ocean University, Dalian, China

5:15  Ultrasonic Guided Waves NDE

B. Djordjevic
Materials and Sensors Technologies, Inc, Glen Burnie, USA
7:30-8:00  Registration and Continental Breakfast - Pacific Ballroom

Plenary Address - Sierra Ballroom

8:00  The State-of-the Art Innovative Technologies for Non Destructive Analysis of the Fine Art Objects And the Cultural and Historical Heritage
R. Maev
Institute for Diagnostic Imaging Research, University of Windsor, Windsor, Canada

8:45-9:00  Coffee Break - Pacific Foyer

Materials Characterization 1 - Sierra Ballroom
Chair: Paul D. Panetta

9:00  Ultrasonic nondestructive evaluation in holmium monopnictides
V. Bhalla, D. Singh, S. Jain
Amity Institute of Applied Sciences, Amity University, Noida, India

9:25  Non-Destructive Characterization of Materials by Combining Electrical Testing and Imaging Methods with Scattering Methods
R. Gerhardt
School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, USA

9:50  Study of Structural Foam Core Used in Aerospace Laminate Construction
O. Esquivel, H. Katzman, D. Patel
The Aerospace Corporation, Los Angeles, USA

10:15  An Experimental Study of Prestress Force Effects on Nonlinear Ultrasonic Characteristics of Concrete Beams
S. Park, S. Shin, H. Kwak
Civil and Environmental Engineering, KAIST (Korea Advanced Institute of Science and Technology), Daejeon, South Korea

10:40  Ultrasonic Scattering Measurements of Grain Size in Nickel and Titanium Alloys
P. Panetta, D. McElhone, H. Du, W. Hassan
Applied Research Associates Inc., Gloucester Point, USA

11:05-12:35 Lunch Break - Pacific Ballroom

Nonlinear NDE - Sierra Ballroom
Chair: Igor Solodov

12:35  Advantages and drawbacks of nonlinear acoustic NDE methods
A. Sutin, H. Salloum
Davidson Laboratory, Stevens Institute of Technology, Hoboken, USA

1:00  Absolute Measurement and Relative Measurement of Ultrasonic Nonlinear Parameter
J. Kim, D. Song, K. Lee, K. Jhang
School of Mechanical Engineering, Hanyang University, Seoul, South Korea
1:25 Non-destructive characterization of XB2 (X= V, Nb and Ta) transition metal diborides
   P. Yadawa
   *Applied Physics, Amity School of Engineering and Technology, New Delhi, India*

1:50 Highly-sensitive defect-selective imaging via linear and nonlinear resonances of defects
   I. Solodov
   *University of Stuttgart, Stuttgart, Germany*

2:15 Acoustic emission to understand the acoustic nonlinear behavior observed in composites
   M. Bentahar, C. Mechri, S. Toumi, R. El Guerjouma, F. Boubenider
   *Laboratoire d’Acoustique de l’Université du Maine, Université du Maine, Le Mans, France*

2:40-2:55 Coffee Break - Pacific Foyer

**NDE of Infrastructure - Sierra Ballroom**

Chair: Glenn Washer

2:55 Developments for Thermographic Inspection of Bridges
   G. Washer
   *Civil and Environmental Engineering, University of Missouri, Columbia, USA*

3:20 Hidden loss quantification of total cross section for main cable of suspension bridge based on magnetization curve measurement
   J. Kim, J. Kim, J. Park, A. Zhang, S. Park
   *Sungkyunkwan University, Suwon, South Korea*

3:45 Tensile force monitoring for Pre-Stress tendon of PSC Girder by incorporating FBG and EM sensor
   J. Kim, J. Park, J. Kim, H. Lee, S. Park
   *Sungkyunkwan University, Suwon, South Korea*

4:10 Neutron Tomography Measurement of Delayed Ettringite Formation in Concrete
   R. Livingston, S. Feuze, A. Amde, D. Hussey, D. Jacobson
   *Materials Science & Engineering, University of Maryland, Washington, USA*

4:35 Visualization of Delamination Condition of CFRP Laminated Concrete
   C. Lee, J. Kim, J. Park, A. Zhang, S. Park
   *School of Civil, Architectural, and Environmental Engineering, Sungkyunkwan University, Suwon, South Korea*

5:00-5:15 Afternoon Break - Pacific Foyer
Phased Array - Sierra Ballroom

Chair: Mourad Bentahar

5:15  Total focusing method imaging for flaw characterization in homogeneous media
     G. Dao, E. Carcreff
     Advanced OEM Solutions, Cincinnati, USA

5:40  Influence of seamless pipes wall thickness variation for the effectiveness of Automated Ultrasonic Testing
     R. Molica Nardo, D. Cerniglia
     Dipartimento di Ingegneria Chimica, Gestionale, Informatica, Meccanica, University of Palermo, Palermo, Italy

6:30-10:00  Banquet - Bayview Ballroom
7:30-8:00  Registration and Continental Breakfast - Pacific Ballroom

Plenary Address - Sierra Ballroom
8:00  Our Aerospace Legacy
  G. Blackburn
  Aerospace Legacy Foundation, Downey, USA

8:45-9:00  Coffee Break - Pacific Foyer

Materials Characterization 2 - Sierra Ballroom
  Chair: Roman Gr. Maev
9:00  Mechanical Properties of the Surface Material and Dust Particles of Comet 67P/Churyumov-Gerasimenko Measured by CASSE and DIM on board Rosetta’s Lander Philae
  Department of Materials, Saarland University, Saarbruecken, Germany

9:25  Ultrasound Based Characterisation of Anisotropic Conditions in Metallic Materials and Structures
  C. Boller, E. Schneider
  Chair in NDT and Quality Assurance, Saarland University, Saarbrücken, Germany

9:50  Ultrasonic inspection of steel-adhesive and aluminum-adhesive multi-layered joints
  B. Ghaffari, K. Lazarz, J. Dekam, R. Maev, S. Titov, M. Pantea
  Ford Motor Company, Dearborn, USA

10:15  Real-time ultrasonic analysis of capacitor discharge spot welding processes
  N. Lehmann, A. Chertov, M. Grabau
  Planning car body construction, Porsche Leipzig GmbH, Leipzig, Germany

10:40  Characterization of porous material using ultrasonic slow wave
  L. Lin
  Engineering, University of Southern Maine, Gorham, USA

11:05-12:35  Lunch Break - Pacific Ballroom

NASA 2 - Sierra Ballroom
  Chair: Cara A. C. Leckey, William H. Prosser
12:35  Composite Overwrapped Pressure Vessel (COPV) Liner and Thin Wall Metallic Pressure Vessel Inspection Scanner Development and Assessment
  R. Saulsberry, W. Prosser
  NASA White Sands Test Facility, Las Cruces, USA
1:00  Eddy Current Techniques for Defect Characterization and Manufacturing Control in Composite Overwrap Pressure Vessel Liners  
B. Wincheski, M. Horne, P. Juarez  
NASA Langley Research Center, Hampton, USA

1:25  Acoustic Response of the Villari Effect for Measuring Dynamic Material Behavior  
M. Horne, E. Madaras  
National Institute of Aerospace, Hampton, USA

1:50  Fracture Strength Degradation in Fused Silica from Stresses Induced at Collision Sites  
W. Yost, E. Cramer  
NASA Langley Research Center, Hampton, USA

2:15-2:30  Coffee Break - Pacific Foyer

Thermography - Sierra Ballroom  
Chair: David Moore

2:30  Method for Flash-Thermographic Determination of Thermal Properties for Thin, Layered Specimens  
Y. Kim, E. Johnson  
The Aerospace Corporation, Los Angeles, USA

2:55  Thermal Response Test to Assess Adhesive Bond Quality in a Microwave Circulator  
E. Johnson, Y. Kim  
The Aerospace Corporation, Los Angeles, USA

3:20  Detection of Steel Fibers in Cement-based Materials by Active Microwave Thermography  
A. Foudazi, I. Mehdipour, K. Donnell, K. Khayat  
Applied Microwave Nondestructive Testing Laboratory, Missouri University of Science and Technology, Rolla, USA

3:45  Low Mass Low Velocity Impact Assessment on Solid Laminate Composites using High Speed Infrared Imaging  
D. Moore  
NDE Ultrasonics \ Experimental Mechanics NDE & Model Validation, Sandia National Laboratories, Albuquerque, USA

4:10  Development of Portable Modulated Thermography System for Image Restoration of Ancient Wooden Tablet  
N. Kim, S. Lee, H. Kim, S. Bae, S. Oh  
School of Mechatronic Engineering, Korea University of Technology and Education, Cheonan, South Korea

4:35-4:50  Afternoon Break - Pacific Foyer
Structural Health Monitoring - Sierra Ballroom

Chair: B. Boro Djordjevic

4:50 Novel illumination and parameter extraction technique for the characterization of multilayer structures in the GHz range with deep sub-wavelength resolution
A. Pourkazemi, J. Stiens, M. Becquaert, M. Vandewal
Vrije Universiteit Brussel, Brussels, Belgium

5:15 Magnetostrictive Sensor for Guided Wave Testing of High Temperature Pipes
S. Vinogradov, G. Light, C. Duffer
Sensors and NDE, Southwest Research Institute, San Antonio, USA

5:40 Correlation techniques for the identification of defects: Case of a non-controllable source
O. Chaouch, K. Raoof, M. Chekroun
Laboratoire d’Acoustique de l’Université du Maine, Le Mans, France
7:30-8:00  Registration and Continental Breakfast - Pacific Ballroom

Invited Speakers - Sierra Ballroom

Chair: Shant Kenderian

8:00  Consideration for Calibration of Sensors and NDE Measurement Systems
W. Rummel
D&W Enterprises, LTD, Littleton, USA

8:30  Advances in Thermographic Material Characterization
S. Shepard, M. Beemer
Thermal Wave Imaging, Inc., Ferndale, USA

9:00  Recent Developments in Shearography NDE of Composite Materials
J. Newman
President, Laser Technology Inc., Norristown, USA

9:30-9:45  Coffee Break - Pacific Foyer

Laser Ultrasound–Sierra Ballroom

Chair: B. Boro Djordjevic

9:45  A case study on the evaluation of friction stir welds by ultrasonic inspection technique
D. Cerniglia
Dipartimento di Ingegneria Chimica, Gestionale, Informatica, Meccanica, Università di Palermo, Palermo, Italy

10:10  Assessment of Thermal Aging of Aluminum Alloys by Acoustic Nonlinearity Measurement of Surface Acoustic Waves
H. Seo, J. Jun, D. Pyun, K. Jhang
School of Mechanical Engineering, Hanyang University, Seoul, South Korea

10:35  Laser ultrasonic characterization of materials properties
B. Djordjevic
Materials and Sensors Technologies, Inc, Glen Burnie, USA

11:00-12:30 Lunch - Pacific Ballroom

Imaging - Sierra Ballroom

Chair: Shant Kenderian

12:30  Ultrasound-Based Diagnostic Assay of Cancer Cell Invasiveness
A. Weitz, N. Lee, J. Hwang, R. Chow, K. Shung
Ophthalmology, University of Southern California, Los Angeles, USA

12:55  Modular ultrasound arrays with co-integrated electronics
R. Wodnicki
Viterbi School of Engineering, University of Southern California, Sunnyvale, USA
1:20 High Frequency ultrasound: a new frontier  
*K. Shung*  
*Biomedical Engineering, University of Southern California, Los Angeles, USA*

1:45 Development of High Frequency Composites for Ultrasound Transducer Applications  
*H. Chabok*  
*NASA/JPL/Caltech, Pasadena, USA*

2:10-2:25 Coffee Break - Pacific Foyer

**NDE of Bonds - Sierra Ballroom**  
*Chair: Anish Poudel*

2:25 Bond Strength Characterization in Adhesive Joints Using Acoustography NDE and Digital Image Correlation  
*A. Poudel, T. Chu*  
*Mechanical Engineering and Energy Processes, Southern Illinois University, Carbondale, USA*

2:50 Ultrasonic imaging of steel-adhesive and aluminum-adhesive joints using two-dimensional array  
*S. Titov, B. Ghaffari, K. Lazarz, J. Dekam, R. Maev, M. Pantea*  
*The Institute for Diagnostic Imaging Research, University of Windsor, Windsor, Canada*

3:15 Evaluation of coating bonding strength by Ultrasonic Nondestructive Testing  
*Y. Zhu, C. Xu, Q. Lin, D. Xiao, C. Yang*  
*School of Mechanical Engineering, Beijing Institute of Technology, Beijing, China*

3:40 A New Method to Join Aluminum and Steel Using Cold Spray Technology and Resistance Spot Welding  
*R. Maev, W. Perez-Regalado, K. Borodianskiy, A. Chertov, V. Leshchynsky*  
*Institute for Diagnostic Imaging Research, University of Windsor, Windsor, Canada*
NDE of the Internal Defect of PVC Pipe using Infrared Lock-in Thermography
J. Gu, H. Lee, C. Lee
Samsung Electronics Company, Gyeonggi-do, South Korea

The development of the phased array ultrasonic testing of welded joints in plastic (PVC) pipes
C. Park, J. Gu, C. Lee
Samsung Electronics Company, Hwaseong, South Korea

In-Situ Radiographic Detection of Improperly Seated Thruster Valve Springs
S. Kenderian, E. Johnson, R. Pan
Materials Processing Department, The Aerospace Corporation, Los Angeles, USA

Porosity Characterization in Composite Laminates Using Acoustography
A. Poudel, R. Spencer, T. Chu, J. Sandhu
Mechanical Engineering and Energy Processes, Southern Illinois University, Carbondale, USA

Development of Portable Modulated Thermography System for Image Restoration of Ancient Wooden Tablet
N. Kim, S. Lee, H. Kim, S. Bae, S. Oh
School of Mechatronic Engineering, Korea University of Technology and Education, Cheonan, South Korea